Statement of
Philip K. Verleger, Jr.[1]

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The increases in gasoline prices and price volatility are attributable primarily to a group of countries conspiring to lift crude prices above the market-clearing level. The effort is led by Saudi Arabia which, while feigning interest in consumers, is quietly exerting a monopoly control over the world oil market similar to that exercised by De Beers in diamonds. The success of this effort since March 1999 has raised crude oil and gasoline prices by more than 100 percent. The increases in gasoline prices this spring, as well as in prior springs, result substantially from the Saudi scheme.

The Saudi tactic has received material support from a surprising source: the US Department of Energy (DOE). Since the fall of 2001, DOE has aggressively added crude oil to the nation's Strategic Petroleum Reserve (SPR). I believe the policy has boosted crude oil prices by as much as $8 per barrel since January 2002. Other economists assert the policy has added as much as $3 per barrel to prices in the last year.

Saudi Arabia's strategy has focused on commercial inventories. The Kingdom has worked aggressively to keep commercial stocks low because its leaders recognize that low stocks result in high commodity prices. Following the recent OPEC meeting, the Saudi oil minister stated, "The inventory where it is now is fine. We don't want any build, not even half a million barrels a day."

The effects of keeping crude oil inventories low has spilled over to gasoline. Refiners cannot afford to keep large gasoline stocks when Saudi Arabia's actions make it financially risky for them to hold excess crude. The consequence is higher refining margins and sky-high spot gasoline prices.

The consumer pays twice for Saudi Arabia's policy. Low crude inventories have added as much as 30 cents per gallon to gasoline prices. Low gasoline stocks — caused by low crude stocks — have added as much as 10 to 15 cents per gallon to the price.

The efforts of oil-exporting countries to elevate prices have been aided and abetted by the US auto industry and US consumers. The increased sales of "gas-guzzling" sport utility vehicles and trucks have reversed a twenty-year trend in increased fuel economy.

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[1] President, PKVerleger LLC, and Visiting Fellow, Institute for International Economics. Contact: pverleger@compuserve.com. The views expressed in this testimony are solely those of Dr. Verleger.

The oil industry has not responded to demand growth with the necessary investments in refining capacity. Environmental regulations that delay construction may have contributed to the lack of investment. The gradual exit of integrated companies from refining is also contributing to the dearth of money.

Inadequate investment creates a situation where unconstrained demand for gasoline rises faster than supply. Annual retail price increases of as much as 20 percent during peak driving periods will be required to balance the market in the future unless imports from foreign suppliers meet increases in demand. The acceleration of global economic growth, particularly in China, makes the availability of these imports less likely.

The Congressional oxygenate mandate specified in the Clean Air Act Amendments of 1990 has seriously complicated the manufacture and distribution of gasoline, contributing to localized shortages and product unavailability.

The substation of ethanol for MTBE further complicates compliance with the oxygenate mandate by reducing the amount of "real gasoline" (technically gasoline blend stock) that can be produced per barrel of crude refined. Lobbyists for agricultural interests in Congress have effectively reduced the manufacturing capacity of West Coast refineries by perhaps 10 percent.

The merger policy applied by the Federal Trade Commission (FTC) has restricted the growth of the nation's gasoline supply. The policy has focused on the number of refineries and the capacity of refiners. Divestitures of refining capacity have been required. On occasion, these divestitures have denied merging companies the opportunity to achieve very large increases in economies of scale by combining two adjacent facilities. A different policy might have boosted supply by as much as 5 percent.

The expansion of smaller independent refiners threatens to make supply more uncertain. These firms now own 34 percent (or 4.7 million barrels per day) of US refining capacity. This represents an increase of 360 percent in capacity operated by small companies since1985. These firms appear to be undercapitalized and, as a result, less able to finance inventories. Their limited finances play straight into the hands of those wanting to keep global crude markets tight and prices high, in other words, into the hands of Saudi Arabia.

The Producer Conspiracy

Primary responsibility for the increase in the level and volatility of gasoline prices rests with oil-exporting countries. Beginning in March 1999, these nations have worked aggressively to restrain output in order to boost crude oil prices. They have succeeded most of the time. The market price for crude oil has risen from $10 per barrel to almost $40 per barrel as a direct result of their actions.

The price increases were achieved by a conspiracy that would be illegal in the United States or most any other country if undertaken by private companies. The conspiracy may even be illegal under US law. In its absence, most studies suggest that the market price for crude oil in the "but for" world would be less than $19 per barrel for West Texas Intermediate (WTI), the common indicator of US crude oil prices.

The coordinated action of oil-exporting countries is doubly troubling because it has come about through coercion. The largest members of the Organization of Petroleum Exporting Countries (OPEC) have demanded that non-OPEC countries join in production cuts. These demands were backed by threats of a price war. In one episode, some close US allies — Mexico, Norway, and Russia — were forced to participate in output reductions when OPEC members, particularly Saudi Arabia, threatened to increase production and drive prices to low levels if they did not cooperate. Saudi Arabia has recently stated that it can export 14 million barrels per day for a sustained period by maximizing output and drawing from its strategic reserves. Such an export level would be roughly twice the country's current output. Output of this magnitude would depress crude prices to levels not seen for more than seventy years.

The OPEC conspiracy has had two important impacts on gasoline markets. First, higher crude oil prices are passed through to consumers in the form of higher gasoline prices. Second, OPEC nations have caused refiners to hold lower product stocks. The lower product stocks result in higher refining margins. Consumers pay twice: once to OPEC and then again to refiners.

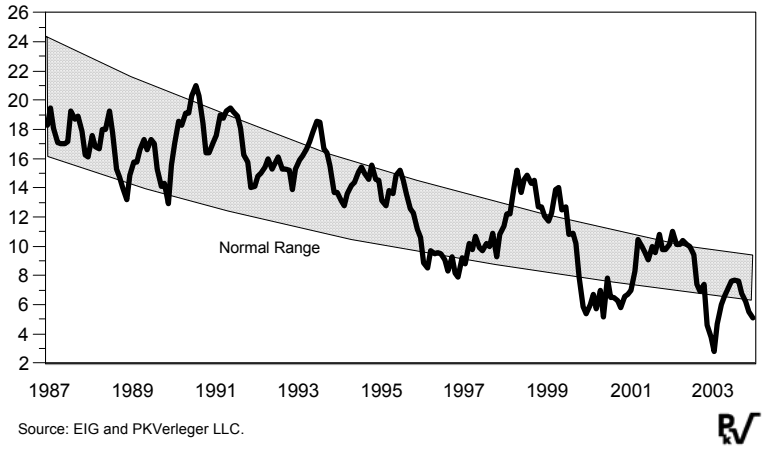
OPEC has pursued this goal because market agents will hold fewer stocks when prices are above the long-run equilibrium level, as commodity economists have known for decades.[2] The success of OPEC's action is illustrated in Figure 1 (page 4). This figure shows days of usable[3] supply of crude and product held in industrialized countries. The shaded area is the "normal range" in which stocks have been observed to fluctuate two-thirds of the time. One can note that stocks were well above the normal range in late

[2] On this, see John Maynard Keynes, "The Policy of Government Storage of Foodstuffs and Raw Materials," *The Economic Journal* (September 1938), reprinted in Donald Moggridge and Susan Howson (eds.), *The Collected Writings of John Maynard Keynes* (London: Cambridge University Press, 1982); Holbert Working, "The Theory of the Price of Storage," *American Economic Review* 48 (1949), pp. 1254-1262; Michael J. Brennan, "The Supply of Storage," *American Economic Review* 47, No. 1 (1958), pp. 50-72; or Jeffrey C. Williams, *The Economic Function of Futures Markets* (Cambridge, England: Cambridge University Press, 1986).

[3] Petroleum stocks are broken into usable and minimum working levels of inventories. Usable stocks are the portion of inventories that can be drawn. Here they are converted into days of supply.

1998, early 1999, and again in late 2001. Prices were low during these periods. One can also note that stocks were drawn down to low levels in late 1999 and 2000. Prices rose to high levels during these times.

Figure 1
Usable Commercial Petroleum Stocks in OECD Countries



Many experts assert that OPEC will be unable to sustain its cut in production. Again and again we read that OPEC prices will drop. In fact, only a month ago experts predicted crude prices would fall to $26 per barrel in the second quarter of 2004. Saudi Arabia has taken steps to make sure this will not occur. The country's state oil company has created strategic reserves and an export capacity that now exceeds 14 million barrels per day. Following the precedent set by De Beers, the manager of the global diamond cartel, Saudi leaders have warned that the export capacity will be used if other countries decide to engage in a battle for market share.

DOE's Role

The US Department of Energy has aided and abetted Saudi Arabia's effort to sustain artificially high crude prices. DOE has been building the Strategic Petroleum Reserve since November 2001. The United States added 36.7 million barrels of crude to the nation's SPR in 2003 alone. The addition of this volume of crude when stocks were extraordinarily tight by historical standards raised the overall level of crude prices. Using a sophisticated model of the crude oil forward price curve, I have estimated that the cumulative impact of this strategy raised oil prices at the end of 2003 by between $5 and $10 per barrel. Separately, economists at Goldman Sachs estimate the DOE policy added $2.25 per barrel to crude prices in 2003.[4]

The Role of Demand

Strong consumer demand for gasoline caused by increased vehicle registrations and the decline in fuel economy of new cars and trucks — especially the large sport utility vehicles (SUVs) — have also contributed to gasoline price increases and the rise in gasoline price volatility. Quite simply, automakers have exacerbated the supply-and-demand imbalance. While selling ever-larger numbers of inefficient vehicles, they have ignored the problem of increasing the supply of gasoline and diesel fuel to meet the

[4] *Goldman Sachs Commodities Weekly*, January 16, 2004, p. 5.

greater requirements generated by SUVs and small trucks. Instead, the auto industry has engaged in a "Field of Dreams" form of advertising: telling American they can go anywhere in their new oversized trucks but failing to warn them that adequate fuel supplies may not be available.

My very rough and simplistic calculations suggest that retail prices during the peak driving season may have to rise annually at a rate of 10 to 20 percent to balance the market. Such increases would be required if unconstrained consumer demand for gasoline rises by 3 percent per year on a year-over-year basis (roughly the rate of growth in California), while the gasoline supply grows by only 1 percent. Unfortunately, greater gasoline price volatility is a direct consequence of automaker's current penchant to sell larger and larger, less-fuel-efficient vehicles and the consumers' willingness to buy them.

Now I recognize that 10 or 20-percent increases in gasoline prices in the summer are not politically attractive. However, the only alternatives will be to increase imports of gasoline from refineries in South America, Europe, and Asia or convince consumers to reduce their driving voluntarily.

In past years, firms supplying California consumers have been able to moderate price increases by importing gasoline components from countries in the Pacific Basin such as Singapore, Korea, and China. California has also received imports from refineries in Nova Scotia, Scandinavia, and the Caribbean. For example, one major was able to mitigate the problems caused by the rupture of the Kinder Morgan pipeline in Arizona last summer by shipping product from Korea. California consumers benefited because there was little competition for these supplies.

I am afraid California may be in for a rude awakening this summer as buyers for consumers in China, Indonesia, and other regions of the world — as well as from New York and Connecticut — compete for these supplies. The volume of imports may be reduced and the price of imports may well be much higher. Last year, DOE reported that summer retail gasoline prices in California peaked at roughly $2.10 per gallon in August. This summer increased demand related to population growth and decreased fuel efficiency may boost market-clearing prices to $2.50 per gallon.

The Oxygenate Mandate

The nation's gasoline supply has also been adversely affected by the oxygenate mandate imposed by Congress in 1990. When this rule was passed, some scientists believed that including oxygenates in reformulated gasoline (RFG) might improve air quality. Their claim has since been disproved. Yet Congress and the EPA have continued to insist that RFG contain oxygenates. These requirements have complicated gasoline distribution and contributed to higher gasoline prices, as the Federal Trade Commission noted in its review of the Midwest gasoline price increases.[5]

[5] See "Midwest Gasoline Price Investigation," Final Report of the Federal Trade Commission, March 29, 2001. [http://www.ftc.gov/os/2001/03/mwgasrpt.htm]

The displacement of MTBE by ethanol will exacerbate the problem by reducing the volume of gasoline refiners can produce.

The FTC's Merger Policy

The Federal Trade Commission has mandated the divestiture of refining assets in three of the petroleum mergers it has reviewed in the last ten years. These divestitures were required by the merger guidelines adopted by the FTC and the Department of Justice, guidelines not prepared specifically for the petroleum industry.

Unfortunately, this "cookbook" application of merger guidelines to the petroleum industry has adversely affected the expansion of gasoline supply by preventing firms from taking advantage of unique opportunities and by forcing the transfer of refining assets from well-capitalized integrated companies to undercapitalized independent refiners.

The loss of unique opportunities is certainly the least understood consequence of the FTC merger policy. While it is widely recognized that petroleum refineries provide the classic example of an increasing returns to scale business, most observers do not know that refinery expansion is constrained by space. Larger refineries require more land. Today, land is not available at most sites. This means that refinery expansions can occur only if two existing plants can be combined. The evidence suggests that very large gains in capacity can be achieved when such combinations can be made.

The merger of the Shell and Texaco refining and marketing businesses provided an excellent opportunity to apply this reasoning because the two firms had adjacent facilities in the State of Washington. However, the opportunity was lost when Shell was required to sell its refinery. This divestiture may have reduced long-run gasoline supply.

The FTC has also required other merging firms to divest refineries. Exxon had to sell off its Benicia refinery when it acquired Mobil. The buyer was an independent. More recently, the FTC required the same independent to sell its Avon, California refinery to an even smaller firm. Each sale moved refining capacity to firms with less capitalization. Over time, these sales will reduce gasoline supply.

The loss in supply could be particularly acute beginning this year when refiners must reduce the sulfur content in gasoline. The new EPA regulations will require increased capital spending by refiners. Because small firms have less access to capital markets, their investments may have to be limited and they may be forced to cut supply. Indeed, one undercapitalized independent, Premcor, closed a Midwest refinery because it could not raise the capital required to upgrade it. Other independent refiners may have to take similar steps.

These rules may not seem relevant to California because our refiners have already cut the sulfur content of gasoline they produce. However, any loss of capacity anywhere will affect us because demand in other regions must be met. If gasoline buyers in New York cannot meet demand from traditional suppliers, they will turn to the same refiners in

Nova Scotia, Scandinavia, and the Caribbean used by California buyers. Everyone will pay a higher price.

In summary, the application of merger guidelines to refining has shifted a portion of US refining capacity from well-capitalized integrated companies to smaller independent refiners that may lack the financial resources to expand capacity. The merger policy may also have prevented firms from expanding capacity at certain critical facilities.

The Role of Independent Refiners

The emergence of independent refiners as significant gasoline suppliers may inadvertently increase gasoline price volatility because these firms often lack adequate working capital to chase rapidly rising crude prices. The undercapitalization of independent refiners may constrain the activity of such firms at times of rising crude prices, especially when oil-exporting countries exercise market power. The constraint comes from the cost of a cargo of crude. The increase in crude prices from the high teens to the high thirties can raise the price of a crude oil cargo by $10 to $20 million, while an incremental cargo may cost more than $50 million. The magnitude of these sums relative to the working capital available to these companies may cause them to reduce oil purchases when crude oil prices are volatile or oil-exporting countries attempt to reduce production and raise prices.

These firms must be especially careful when there are widespread expectations that crude oil prices will fall. In such a situation, an independent refiner that gets caught with excess crude inventories faces potential financial ruin.

A spokesperson from one independent provided support for this assertion. Commenting on the firm's reasons for cutting inventories prior to the invasion of Iraq, she made this statement to *The Washington Post*'s Peter Behr:

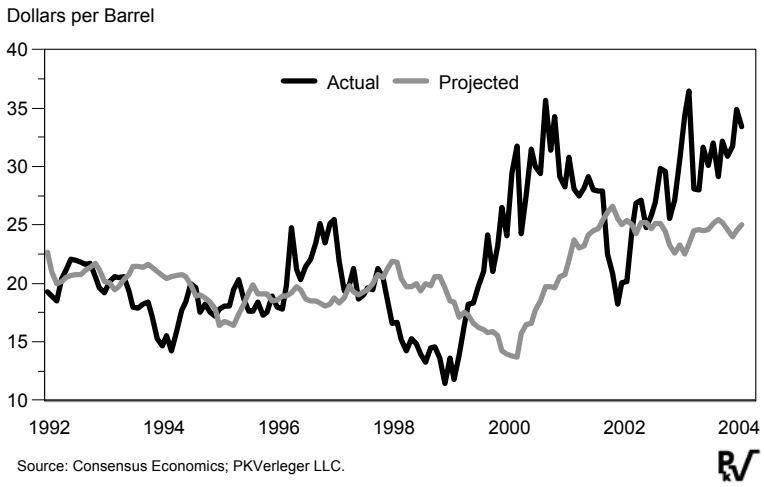
> "If we ever get past this crisis, crude prices will drop like a rock," said Mary Rose Brown, vice president and spokesman of Valero Energy Corp. in San Antonio, one of the largest US refiners. "Does it make you more cautious? Yes. Any barrel you buy today that would have been cheaper next month — that would be a stupid move."[6]

OPEC ministers, particularly Saudi Arabia's Ali Naimi, have become very adept at managing market expectations. For the last four years, forecasters have systematically underestimated OPEC's capacity to sustain high prices. This can be seen from Figure 2 (page 8). There I compare the consensus one-year-ahead forecast of WTI as published by *Consensus Forecasts* with the realized price. The four-year average of the projected prices was $22.60 per barrel. The four-year average of the realized price was $28.60.

[6] Peter Behr, "Rising Oil Prices Slow Flow to US Refineries, Stockpiles of Fuel at Historic Lows," *The Washington Post*, March 31, 2003, p. A22.

OPEC's success in managing expectations has prevented firms from buying crude. Consumers have suffered the consequences.

Figure 2
Consensus Economics Forecasts v. Realized Oil Prices



California Environmental Regulations May Impart "Seasonal Noise" into Prices

Data on retail prices published by DOE suggest California can expect an increase in prices of $0.50 per gallon during the first five months of the year. The increases have occurred like clockwork for the last six years. Three times they have been followed by price decreases. My impression is the increases can be attributed to excessively rigid environmental rules that require *all* winter gasoline to be out of the distribution system by a specific date. The rules force companies to empty tanks and run down inventories, effectively emulating the strategy pursued by Saudi Arabia. Now, it is not my intention to accuse the California Air Resources Board of implementing a conspiracy to raise gasoline prices, but its actions are having precisely that effect. I am certain that introducing flexibility into the rules might moderate the price increases observed over the last six years. Such a change might save California consumers as much as $1 billion per year.

Conclusion

This inquiry has been convened to determine the causes of gasoline price increases and volatility. As I have indicated above, a number of factors explain the rise in prices.

The most important cause of the increase in gasoline prices since 1999 has been the success of OPEC's conspiracy. The limitation of crude production by oil-exporting countries has forced prices to rise from levels around $18 per barrel, which I would assert are "equilibrium levels," to the mid-thirties.

A second key factor is the strong growth in the economy combined with the sale of large, fuel-inefficient vehicles. The auto industry's flaunting of the spirit of fuel economy standards has contributed to a strong growth in gasoline demand, growth that US refiners cannot meet.

The third factor has been the FTC's merger policy. In the interest of promoting competition, the FTC has required divestitures of refineries, and this has inadvertently boosted price volatility.

The final factor is US environmental regulations. These rules make it impossible to build new refineries or expand existing ones. Consequently, prices must increase to offset the rise in unconstrained demand created by fuel-guzzling vehicles. These regulations also make it more difficult to manufacture gasoline by requiring unneeded oxygenates in fuel. The oxygenate requirements reduce supply and raise prices. Lastly, seasonal transition rules that force firms to run inventories to minimum levels at the end of February create artificial shortages that push up prices.